Manitoba

Agriculture

Date: April, 1988
Agdex No. 420-50-84

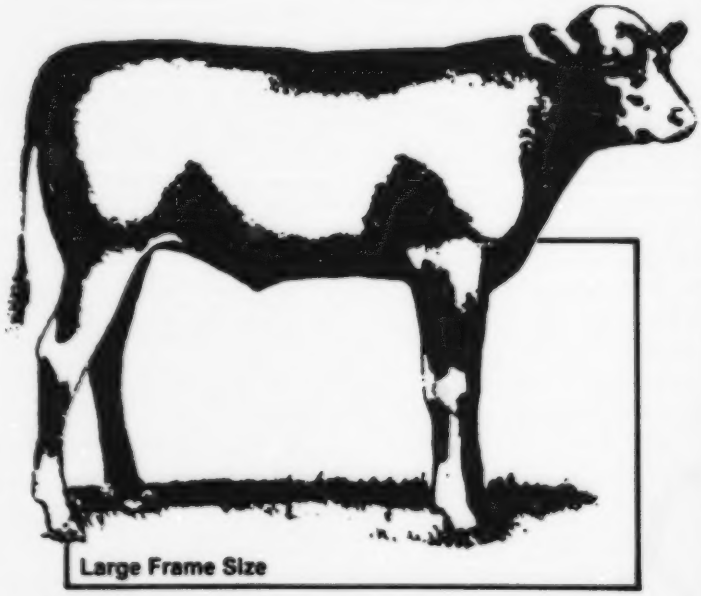
Beef Facts

Feeding and Judging For Finish

Introduction

The challenge in feeding cattle to finish is to match the right feeding level with the growth capability of the animal to produce a quality carcass at a profit.

To do this, the relationships between frame size, feed requirements and carcass quality must be understood. The economic consequences of over or under finishing, plus how to judge optimum finish in slaughter cattle must also be known.



Large Frame Size

Concept of Frame Size

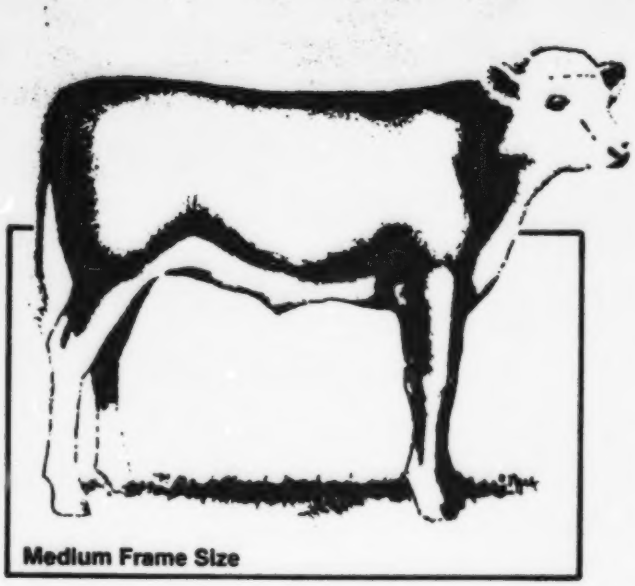
When finishing cattle, it is important to recognize that there are breed differences in growth rate, fleshing ability and final slaughter weight.

Efficient feeding programs utilize the concept of frame size to manage cattle according to their genetic makeup. Frame size itself is characteristic of the genetic background of the animal and not generally affected by management. It actually refers to an animal's skeletal size — height and length in relation to its age. Feeding an animal to produce a carcass with a specific degree of fatness or quality grade (i.e. A1) requires correct management to achieve a desired weight for a given frame size.

Large Frame Size

Cattle qualifying for the minimum of this classification have large frames and are tall and long-bodied for their age. Steers and heifers would not be expected to produce carcasses with the amount of external fat thickness at the rib eye normally associated with the A1 grade, until live weights reach or exceed 544 kilograms (1,200 lbs.) for steers and 454 kilograms (1,000 lbs.) for heifers.

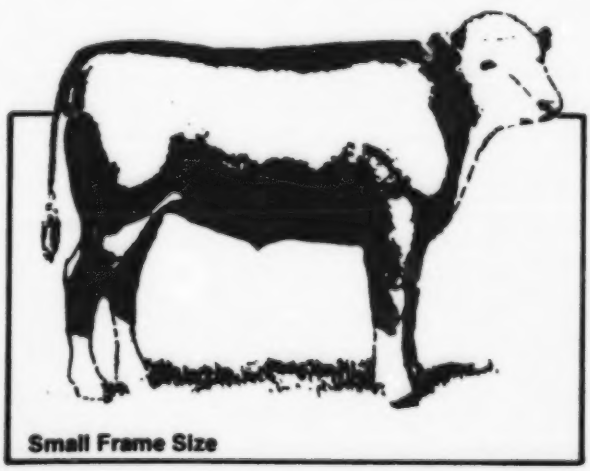
MG-18113



Medium Frame Size

Medium Frame Size

Feeder cattle having minimum qualifications for this classification are intermediate in frame size and are slightly tall and long bodied for their age. Steers would be expected to have the external fat normally associated with the A1 grade at liveweights between 454 and 521 kilograms (1,000 to 1,150 lbs.). Heifers should reach this stage from 386 to 430 kilograms (850 to 950 lbs.).



Small Frame Size

Small Frame Size

Feeder cattle in this classificiation have small frames, are shorter-bodied and not as tall as specified for the medium frame classification. Cattle would be expected to produce carcasses with external fat normally associated with the A1 grade at liveweights less than 454 kilograms (1,000 lbs.) for steers and below 386 kilograms (850 lbs.) for heifers.

Frame Size Affects Performance

How does frame size affect the performance of animals in the feedlot? When fed the same ration, cattle of different breeds grow at different rates and finish at different weights. Why does this occur?

Growth from the time of conception to maturity is a very orderly process. It starts with differentiation in the fetus; development of the brain and nervous system, development of the skeletal system, the muscle and finally the adipose (fat) tissue. Animal growth can be monitored by plotting body weight against age. If the animal is allowed to grow until it no longer gains weight, the growth curve is similar to Figure 1. By dividing this curve into four segments, it is possible to examine the composition of the weight gain as the animal grows (Figure 2). From birth to 204 kilograms (450 lbs.) there is a high rate of bone and muscle growth. From 204 kilograms (450 lbs.) to about 408 kilograms (900 lbs.), muscle growth continues at a high rate. During this period the skeleton is starting to reach its mature size and bone growth begins to decline. Note in Figure 2 that at about 317 kilograms (700 lbs.) there is an acceleration in the rate of fat deposition. As the animal continues to gain weight, an increasing amount of the weight gain is comprised of fat. After 540 kilograms (1,200 lbs.), 90 to 95 per cent of the weight gain is fat. Ideally, this animal should

Figure 1. *A typical growth curve for cattle showing the four stages of growth.*

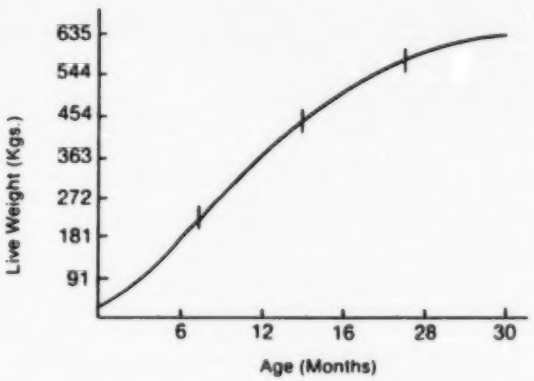
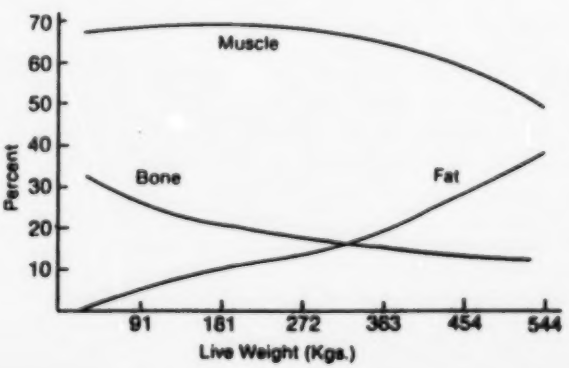


Figure 2 *Carcass composition of cattle during growth.*



have been slaughtered towards the end of the third phase of growth when it weighed about 1,100 lbs. and carried enough fat over the loin to grade A1. Feeding past this weight can be an expensive and a wasteful mistake. Not only does excess fat devalue the carcass, it is the most expensive portion of the weight gain in the feedlot.

Level of Nutrition

For each stage of growth a specific balance of protein, energy, minerals, vitamins and water is required. To get efficient growth and fattening the right nutrients must be supplied in the right amounts at the right time.

Since there is a variation in growth between breeds, they will also vary in their nutrient requirements for the various stages of growth and fattening. When fed the same ration, small framed cattle may be finished at 408 to 454 kilograms (900 to 1,000 lbs.), while larger framed cattle may still require another three to four months of feed. If underfed during this last stage, these cattle may not reach the A grade and will be discounted accordingly.

When planning a finishing program, it is essential to take into account the type of cattle being fed. You must feed a balanced ration that matches their growth rate and supplies sufficient energy to enable them to fatten at the proper stage. Feedlot operators recognize this, and when feeding weaned calves commonly make use of at least three specific rations; a low energy starter, a medium energy grower and a high energy finisher.

Starter rations are used to accustom animals to the feedlot and to start animals eating as soon as possible. Starter rations generally consist of a good quality grass hay and free access to a plentiful supply of water. After a few days in the feedlot they can be introduced to either the growing or finishing ration. Any changes must be carried out gradually to prevent digestive upsets such as founder or acidosis.

Growing or backgrounding rations are used to grow out weaned calves to a certain body weight before placing them on a finishing ration. Backgrounding is necessary with small and medium framed calves in order to prevent them from fattening at light weights. When feeding these type of calves it is recommended that they be grown out at the rate of .68 to .79 kilograms (1.50 to 1.75 lbs.) per day until steers weigh 340 to 363 kilograms (750 to 800 lbs.) and heifers 295 to 318 kilograms (650 to 700 lbs.). When these weights have been obtained on the growing ration, small and medium framed animals can then be gradually introduced to the finishing ration. Large framed calves do not require as long a growing period, and can be put on finishing rations by 272 to 318 kilograms (600 to 700 lbs.). Growing out to heavier weights will result in heavy carcasses and discounts at slaughter.

Finishing rations are designed to take animals from 295 to 363 kilograms (650 to 800 lbs.) through to final slaughter weight and an acceptable degree of finish. As such they must not only promote growth but must also provide sufficient energy to enable the animal to deposit fat. Most finishing rations consist of 75 to 80 per cent grain and 15 to 20 per cent roughage. During this final phase, cattle should gain 1.1 to 1.4 kilograms (2.5 to three lbs.) or more per day.

Special Consideration should be given to the feeding program for large frame steers. A number of research studies have shown that large frame steers gain more efficiently and finish at a younger age if they are placed on a high energy ration from the start. To date, profitable results have been achieved by using a ration formulated to 78 per cent T.D.N. and 13 per cent protein, fed from weaning.

This will not work for British breeds, as a high energy ration will fatten these animals much too soon for optimum market value.

Through effective use of growing and finishing rations, the feedlot operator can regulate the weight gain of his cattle. This not only enables him to control the quality of his product (i.e. the dressed beef carcass), but will minimize costs. It all adds up to increased profits.

When feeding cattle of a wide assortment of sizes, it is recommended that you sort them according to their frame size to enable you to manage the feeding program separately. If space and a lack of facilities presents a problem, particularly for the cow-calf producer, you may be better off to sort out the top or bottom end of your calves and market one of the groups. You are then left with a reasonably uniform group of calves which can be properly managed.

Carcass Grades

All slaughter cattle are graded the morning following the day they were killed. This allows proper settling, chilling and firming-up of the dressed carcass.

In order to receive the highest market price, finished feedlot cattle must grade A1. Carcasses grading A1 have the following characteristics:

- Are youthful
- Conformation or muscling is free from marked deficiencies
- Meat or lean has a bright, cherry red color
- Carry a fat covering over the 12th and 13th ribs of 4-9 mm (.16 to .35 inches). See Table 1.

Grades A2, A3 and A4 exhibit the same characteristics, but carry a thicker fat covering.

Carcasses fall into other grades for various reasons. B1 graded carcasses have the same characteristics as A1, but carry a fat cover between 2-4 mm. B2 and B3 graded carcasses exhibit similar characteristics to A1, but have less than 2 mm of fat cover and slightly soft white to pale fat. Dark colored carcasses are assigned the B2 grade.

The C grade is assigned to carcasses that exhibit intermediate age or poor muscling.

D grades are reserved for mature animals such as cows and bulls (which may grade E).

Carcass Weights

The Canadian Beef Industry recognizes dressed carcass weight standards and classifications (Table 2). All slaughter cattle processed in Manitoba are subject to these standards. Steer and heifer carcasses must fall into the "standard" weight range to receive top market price.

Table 1. Fat cover requirements for carcass grades.

Grade	A1	A2	A3	A4	B1	B2	B3	C1	C2
Fat requirement (mm)	4-9	9-14	14-19	19+	2-4	1+	1+	1-9	9-19
Characteristics	- youthful - bright red meat					- youthful - lack finish on hips & chuck.		- intermediate age. - deficient muscling	

Table 2. Weight Classifications for Steers and Heifers

Class	Carcass Weight Kg (lbs.)	
X Light Steers	205 - 227	(451 - 500)
Light Steers	227 - 257	(501 - 565)
Standard	257 - 327	(566 - 721)
Heavy Steers	327 - 375	(722 - 825)
X Heavy Steers	375 - 425	(826 - 935)
X Light Heifers	up to 182	(up to 400)
Light Heifers	182 - 205	(401 - 450)
Standard	205 +	(451 +)

Carcass Pricing

Carcass price is determined by carcass grade and weight.

Differentials are the discounts applied to grades and weights not meeting the standard. Prices quoted in all railgrade marketing transactions cover four main standards:

1. Standard weight A1 steers
2. Standard weight A1 heifers
3. Standard weight D1 cows
4. Standard weight E1 bulls

All other weights and grades may be subject to discounts.

Example:

On a given market day, A1 standard steers are quoted at $135.00/cwt. railgraded. A 650 lb. carcass graded A1 would return $877.50 to a producer. A carcass of similar weight but with more fat could grade A3 and be discounted $10.00/cwt. to return $812.50.

Taking the quoted price of $135.00/cwt. for A1 standard, a carcass is graded B1, light at 560 lbs. The discount that day is $15.00/cwt. for B grades and $4.00/cwt. on lights. The result is a $19.00/cwt. discount and a carcass value of $649.60.

The loss on the overfat A3 carcass was $65.00; the loss on the underfinished B1 carcass was close to $228.00. Being able to judge when an animal has reached A1 grade may be the single most important factor in finishing cattle for today's market.

Judging Finish

Fat cover is the main determinant of the grade that will be assigned to each carcass. Fat measurements are taken between the twelfth and thirteenth ribs at the rib eye. Research has established a direct link between the amount of fat and lean meat yield.

The two main points on the beef skeleton which are not covered by muscle are the ribs (particularly the back ribs) and the top line. In order to assess the amount of fat in these areas, use the balls and tips of the fingers and run the hand back and forth over the back rib area. Press firmly enough to move the hide, not just your hand. A finished animal feels like there is a heavy blanket over the ribs. The ribs on an underfinished animal are easier to feel because the bones are directly under the hide.

On a finished animal the topline should be firm but not hard. To feel this area, put the tips of the fingers on the top of the backbone and press down firmly. Any hard bonyness is due to the skeleton, which shouldn't be felt on a well finished animal.

If the animal can't be handled, appraise it visually (see Figure 3). The four main points to look for are as follows:

- First, check the hip or hook bones. A finished animal will be somewhat rounded there, enough so that you can see that the hip angle has become slightly curved.
- Second, check the pin bone area which should be well covered with slight fat deposits on either side of the tailhead. These fat deposits will be more noticeable in heifers.
- Third, look at the twist — the area between the hind legs. On a finished animal the twist will be full. An underfinished animal usually has a narrow stance, indicating that it is not finished in the twist.
- Fourth, when finished, an animal should have well rounded hinds and bunching muscles which ripple when it walks, giving it a waddling or rolling motion.

For more information or assistance in feeding and judging finish in cattle, producers should contact any of the following:

- The Manitoba Beef Commission
- Regional Manitoba Agriculture Livestock Specialists
- Agricultural Representatives

Figure 3. Appraisal Points